What is claimed is:

1. An optical automatic gain controller comprising automatic gain control logic operably coupled to receive an optical input signal having a first intensity range and output an optical output signal having a second intensity range less than the first intensity range.

2. The optical automatic gain controller of claim 1, wherein the automatic gain control logic is operably coupled to amplify the optical input signal at least once if and only if the optical input signal is below at least one predetermined threshold.

3. The optical automatic gain controller of claim 1, wherein the automatic gain control logic comprises a number of automatic gain control stages coupled in series, each automatic gain control stage comprising:

first logic operably coupled to receive a threshold input signal and determine whether the threshold input signal is above or below a predetermined threshold; and

second logic operably coupled to receive a gain input signal and amplify the gain input signal if and only if the threshold input signal is determined by the threshold detection logic to be below the predetermined threshold.

4. The optical automatic gain controller of claim 3, wherein the first logic comprises:

a threshold limiter operably coupled to receive a biased input signal and output at least one signal indicating whether the biased input signal is above or below the predetermined threshold.

5. The optical automatic gain controller of claim 4, wherein the threshold limiter comprises a plurality of optical hard limiters coupled in series.

6. The optical automatic gain controller of claim 3, wherein the second logic comprises:

gain logic operably coupled to receive the gain input signal and output at least an amplified signal equal in intensity to the gain input signal amplified by a predetermined amount; and

gain select logic responsive to the first logic and operably coupled to receive the amplified signal from the gain logic and output the amplified signal if and only if the threshold input signal is determined by the threshold detection logic to be below the predetermined threshold.

7. An optical automatic gain control system comprising:

an optical automatic gain controller operably coupled to receive an optical input signal and output an automatically gain controlled optical output signal; and

a linear amplified operably coupled to receive the optical output signal from the optical automatic gain controller and amplify the optical output signal.

8. An optical threshold limiter comprising a plurality of optical hard limiters coupled in series, wherein the optical threshold limiter outputs at least one signal indicating whether an input signal is above or below a predetermined threshold.